

than it.

5. A semiconductor laser module according to
claim 4, wherein said ambient air temperature is
temperature outside a package of said semiconductor
laser module.

6. A semiconductor laser module according to
claim 5, wherein said semiconductor laser module has no
Peltier cooling means.

7. A semiconductor laser module according to
10 claim 6, wherein said heating element generates heat
depending upon size of a driving signal from said
temperature control unit.

8. A semiconductor laser module, comprising: a
semiconductor laser; a driving circuit for driving said
15 semiconductor laser; a heating element for controlling
the temperature of said semiconductor laser without
involving a Peltier cooling operation; a temperature
sensor for sensing temperature near or around said
semiconductor laser and said heating element; and a
20 temperature control unit for controlling said heating
element on the basis of temperature information from
said temperature sensor, wherein

25 said temperature control unit controls said
heating element so as to keep said semiconductor laser
at the same temperature as ambient air temperature or
higher than it.

9. A semiconductor laser module according to
claim 8, wherein said ambient air temperature is

0 9 2 6 9 3 6 2 6 0 0

temperature outside a package of said semiconductor laser module.

10. A semiconductor laser module according to claim 9, wherein said semiconductor laser module has no
5 Peltier cooling means.

11. A semiconductor laser module according to claim 9, wherein said heating element generates heat depending upon size of a driving signal from said temperature control unit.

10 12. A semiconductor laser module according to claim 4, wherein said semiconductor laser module further comprises a supporting substrate, at least said semiconductor laser, wherein said heating element and said temperature sensor are mounted on top of said
15 supporting substrate, and wherein said heating element controls temperature of said supporting substrate together with said semiconductor laser and said temperature sensor.

20 13. A semiconductor laser module according to claim 12, wherein said semiconductor laser is a Fabry-Perot type laser.

14. A semiconductor laser module according to claim 12, wherein said semiconductor laser is a distribution return shape laser.

25 15. A semiconductor laser module according to claim 12, wherein said semiconductor laser is a distribution return shape laser formed on the same substrate together with a field absorption modulator.

DRAFTS 2000

16. A semiconductor laser module according to
claim 12, wherein said semiconductor laser is not
cooled by Peltier cooling, but is heated by said
heating element and is kept at substantially constant
5 temperature within a predetermined temperature range,
and a wavelength of light is kept substantially
constant within a predetermined wavelength range to be
emitted from said semiconductor laser.

17. A semiconductor laser module, comprising:
10 a semiconductor laser; a driving circuit for driving
said semiconductor laser; a heating element for
controlling temperature of said semiconductor laser; a
temperature sensor for sensing temperature near or
around said semiconductor laser and said heating
15 element; a temperature control unit for controlling
said heating element on the basis of temperature
information from said temperature sensor; and a
supporting substrate, wherein
at least said semiconductor laser, said heating
20 element and said temperature sensor are mounted on a
main surface of said supporting substrate, wherein
a main surface of a semiconductor chip of said
semiconductor laser, on which joining for emitting
laser light has been formed, is disposed on said main
25 surface of said supporting substrate, wherein
said heating element is disposed in proximity to
said joining on said main surface of said semiconductor
chip of said semiconductor laser on said main surface

of said supporting substrate, and wherein
said temperature control unit controls said
heating element so as to keep said semiconductor laser
at the same temperature as ambient air temperature or
5 higher than it.

18. A semiconductor laser module according to
claim 17, wherein said ambient air temperature is
temperature outside a package of said semiconductor
laser module.

10 19. A semiconductor laser module according to
claim 18, wherein said semiconductor laser module has
no Peltier cooling means.

15 20. A semiconductor laser module according to
claim 19, wherein said heating element generates heat
depending upon size of a driving signal from said
temperature control unit.

20 21. A semiconductor laser module according to
claim 17, wherein said heating element is disposed
between said main surface of said semiconductor chip of
said semiconductor laser and said main surface of said
supporting substrate.

25 22. A semiconductor laser module according to
claim 21, wherein said ambient air temperature is
temperature outside the package of said semiconductor
laser module.

23. A semiconductor laser module according to
claim 22, wherein said semiconductor laser module has
no Peltier cooling means.

24. A semiconductor laser module according to claim 23, wherein said heating element generates heat depending upon size of a driving signal from said temperature control unit.

5 25. An optical transceiver comprising an optical receiving module and an optical transmitting module, wherein said optical transmitting module comprises: a semiconductor laser; a driving circuit for driving said semiconductor laser; a heating element for controlling temperature of said semiconductor laser without involving any Peltier cooling operation; a temperature sensor for sensing temperature near or around said semiconductor laser and said heating element; and a temperature control unit for controlling 10 said heating element on the basis of temperature information from said temperature sensor, wherein said temperature control unit controls said heating element so as to keep said semiconductor laser at the same 15 temperature as ambient air temperature or higher than it, and wherein 20

 said optical transmitting module and said optical receiving module are housed within one housing.

25 26. An optical transceiver according to claim 25, wherein said ambient air temperature is temperature outside said housing.

27. An optical transceiver according to claim 25, wherein said optical transceiver has no Peltier cooling means.

28. An optical transceiver according to claim
27, wherein said heating element generates heat
depending upon size of a driving signal from said
temperature control unit.

5 29. An optical receiver, comprising: a
semiconductor photo detector for receiving an optical
information signal from a recording medium or a
communication system; a signal processing unit for
processing an electric signal from said semiconductor
10 photo detector; a heating element for controlling
temperature of said semiconductor photo detector; a
temperature sensor for sensing temperature near or
around said semiconductor photo detector and said
heating element; a temperature control unit for
15 controlling said heating element on the basis of the
temperature information from said temperature sensor,
wherein

20 said temperature control unit controls said
heating element without the use of the Peltier cooling
means so as to keep said semiconductor photo detector
at the same temperature as ambient air temperature or
higher than it.

25 30. An optical receiver according to claim 29,
wherein said ambient air temperature is temperature
outside the package of said optical receiver.

31. An optical receiver according to claim 30,
wherein said optical receiver has no Peltier cooling
means.

32. An optical receiver according to claim 31,
wherein said heating element generates heat depending
upon size of a driving signal from said temperature
control unit.

5